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**The Immune Response: Web Analysis and Teaching Opportunity**

Ms. Ottolini, AP Biology, 2012-2013

***Directions:*** *You and your group members will be assigned a particular topic relating to the human immune system. You will research your topic at the following web site:* [*http://www.niaid.nih.gov/topics/immunesystem/pages/whatisimmunesystem.aspx*](http://www.niaid.nih.gov/topics/immunesystem/pages/whatisimmunesystem.aspx) *. In the space corresponding to your topic below, summarize the information from the website in FOUR bullet points. You may include a diagram as one of your bullet points, if you think this is the best way to depict your concept. You will be presenting your summary to the class and filling in information relevant to all other topics listed below during the presentations.*

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| **Topic** | **Summary** |
| 1. What is the immune system? | 1. The immune system is a network of cells, tissues, and organs that work together to defend the body against pathogens.  2. Once the body senses a pathogen, the immune system signals to the cells to produce chemicals that either regulate their own growth and behavior, call to other immune cells, or directs immune cells to go to the infection.  3. If the I.S. hits a wrong target, it can cause many other disorders (diabetes, arthritis)  4. It destroys pathogens by releasing fluids or cells that matches to the pathogen to remove it. |
| 1. Self and non-self | 1. Recognizes its own bodies cells(self) and then attacks foreign cells 2. Antigen triggers the immune responds 3. Abnormal situations, the immune system attacks its self cells (autoimmune disease) 4. Picture |
| 1. The structure of the immune system | 1. Lymphoid organs have lymphocytes that are key to the immune system  2. Bone marrow is the main source of lymphocytes (white blood cells)  3. B cells become activated and turn into plasma cells that release antibodies  4. Lymphocytes travel through the blood |
| 1. B cells | 1. B cells secrete antibodies into the body  2. Antibodies attack viruses and other pathogens while they are free-floating in the body fluids  3. Every B cell is made to fight against a single pathogen  4. Antibodies are made by active (plasma) B cells |
| 1. T cells | 1. T cells coordinate the immune response of antigens by communicating with other cells  2. Killer T cells attack cells that carry foreign molecules on their surface  3. T cells contain receptors that can see antigens on the surface of infected cells |
| 1. Phagocytes and their relatives | 1. Phagocytes are large white cells that can swallow and digest microbes  Examples:  2. Macrophages – kill worn-out cells  3. Granulocytes – destroy pathogens  4. Dendritic cells (aka APC’s) present antigens to helper T cells 🡪 specific immune response |
| 1. Mounting an immune response | 1. nonspecific defenses come first (ex: skin, enzymes in mucous membranes, macrophages)  2. once past the nonspecific defenses, pathogens travel through the blood  3. If antibodies are present, they can attach to the microbe and mark it for destruction  4. Example microbes – bacteria, viruses, fungi, etc. |
| 1. Immunity: Natural vs. Acquired | 1. Natural – do not need an injection for immunity  2. Acquired – immunity (antibodies) is transferred from one person to another via vaccine ; or once specific immune response is started  3. can use vaccines to stimulate the immune system to produce antibodies |
| 1. Disorders | 1. An immune deficiency disorder occurs when the immune system is missing certain cells  2. can be caused by infections or genetics  3. SCID (severe combined immunodeficiency disorder) occurs in children who lack B or T cells  4. factors preventing the immune system from functioning properly = malnutrition, smoking, stress |
| 1. Transplants | 1. In transplants involving body organs, scientists look at tissue typing and removing T cells from the body  2. Tissue typing is when they look at markers on the tissues to see if they are similar / compatible  3. Bone marrow transplant 🡪 has to be a close match to recipient or T cells will attach to the donor tissue and reject it |
| 1. Research Frontiers | 1. researchers make monoclinical antibodies by injecting mice with the target antigen 🡪 they produce antibodies  2. Immunoregulation = transfer human immune system into a mouse and test it against different pathogens |